

Finding the area of irregularly shaped regions

Forested regions and lakes generally have irregular boundaries. In this portion of the tutorial, you will be asked to find the area of an irregularly shaped object.

Inscribed/Circumscribed Rectangle Method

In this method you overestimate the area of a region with one rectangle and underestimate the area of a region with a smaller rectangle. Averaging the areas gives a quick estimate of the area of the irregularly shaped region.

For our example, we will find the area of an off-shore island near Beverly, MA. In Figure 1, a rectangle defines a region with area larger than that of the island.

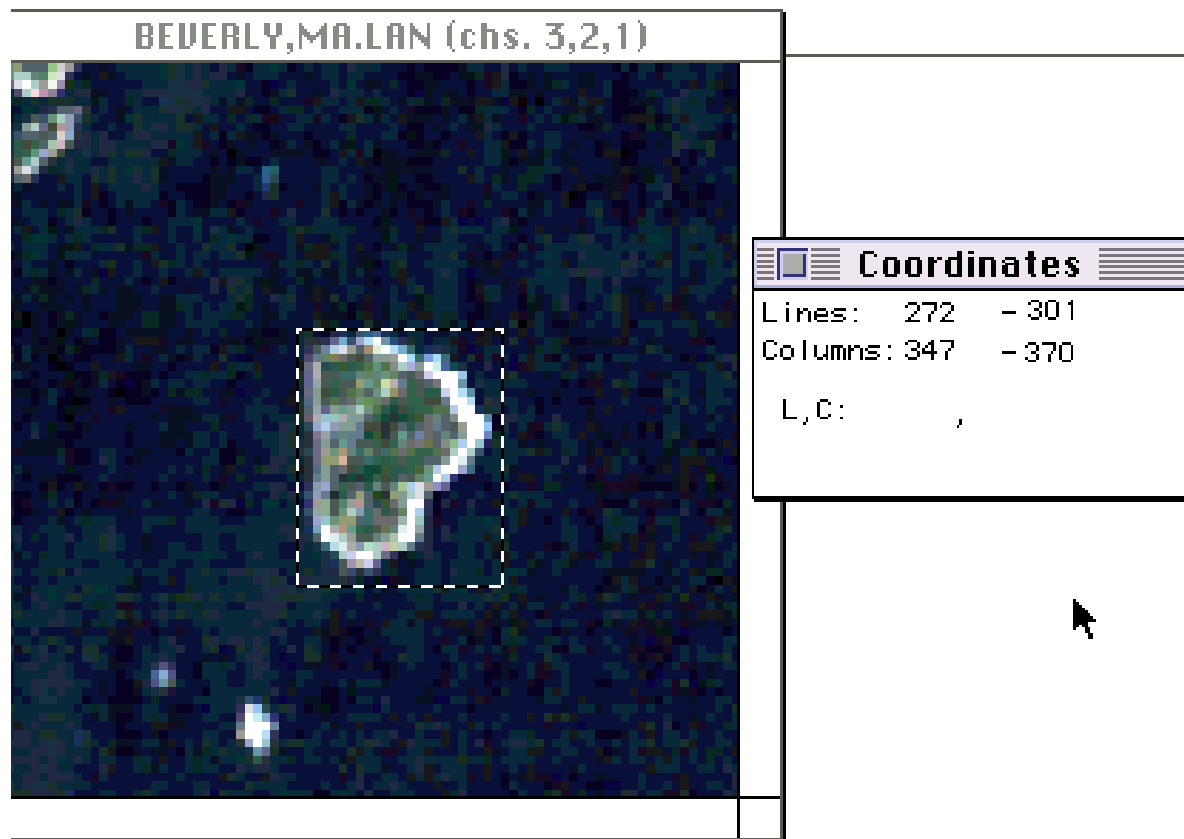


Figure 1

To determine the coordinates of the selected region, under the **Options** menu, select **Show Selection Coordinates**. Note the Coordinates in the figure.

Consider the screen to be a large coordinate graph with (0,0) in the upper left corner, (512,0) in the upper right hand corner, (0,512) in the lower left, and (512,512) in the lower right as shown in Figure 2. Lines are horizontal and can be thought of as rows in a matrix. Columns are vertical and can be thought of as columns in a matrix.

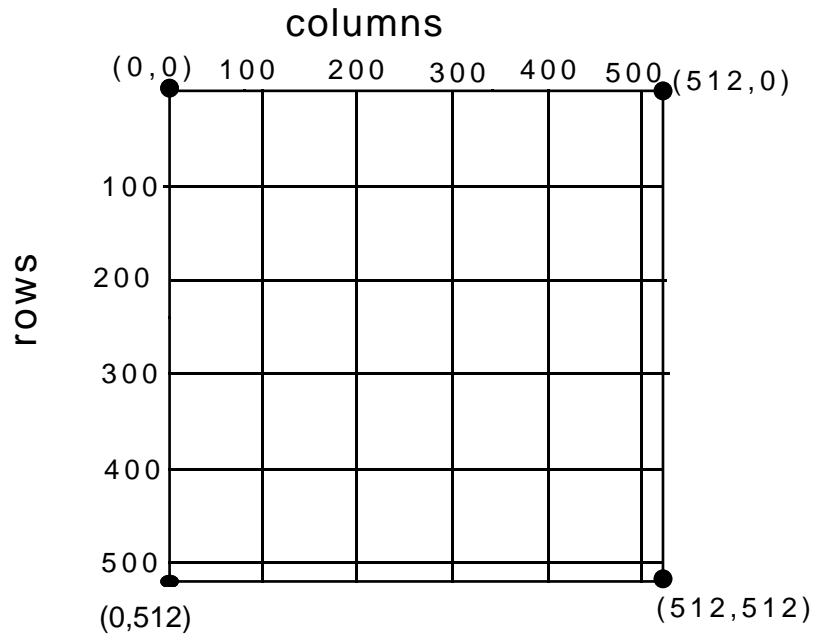


Figure 2

The coordinates in Figure 1 are lines 272 to 301 and columns 347 to 370. Since $301 - 272 = 29$, the highlighted rectangle is 29 pixels in length (vertical) or 30 meters \times 29 = 870 meters. The difference of the columns is $370 - 347 = 23$ pixels. Multiplying, 30 meters \times 23 = 690 meters. The area of the highlighted rectangular region is 870 meters \times 690 meters or 600,300 square metres.

Follow the same procedure to determine the area of the highlighted region in Figure 3 on the following page.

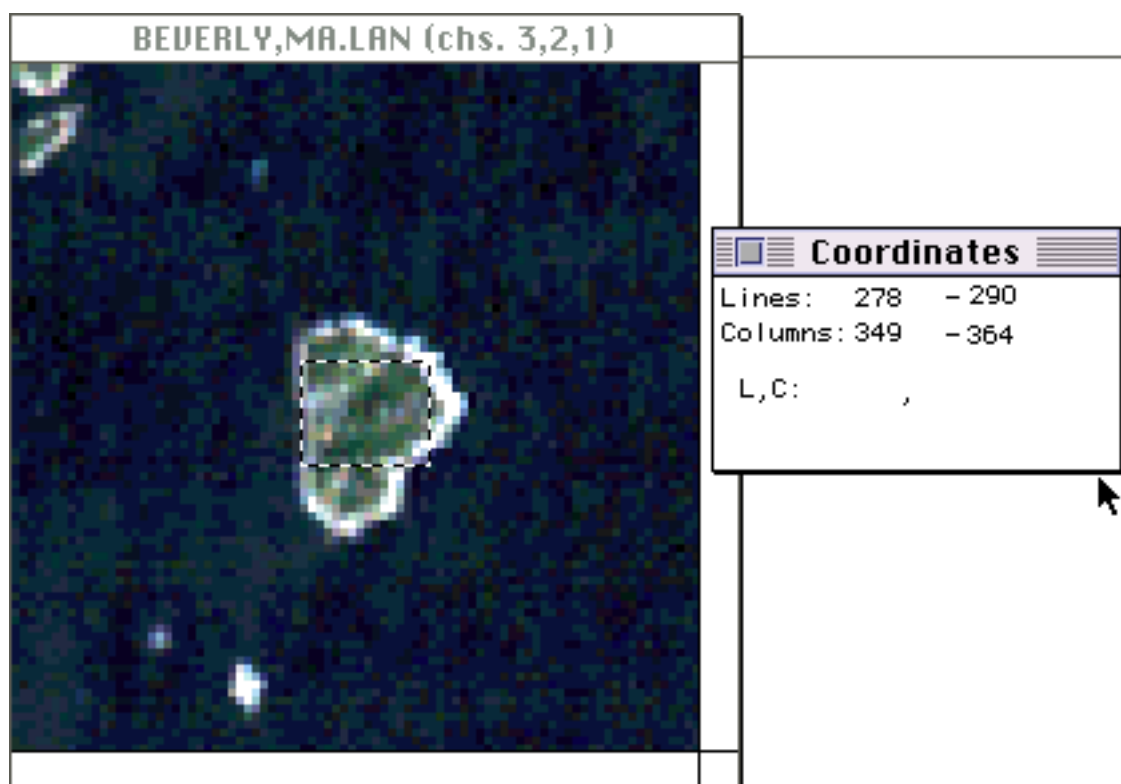


Figure 3

$(290-278) \times 30 = 360$ meters; $(364 - 349) \times 30 = 450$ meters. The area is 360 meters x 450 meters = 162,000 square meters.

Use the information just computed to determine the area of the island.

$(600,300 + 162,000)/2 = 381,150$ square meters. Assuming one digit accuracy, the area is approximately 400,000 square meters.

This concludes the basic portion of the MultiSpec tutorial. You should now be able to use what you have learned here to investigate images of your own area. There are many other capabilities of this software program that are addressed in the advanced portion of this tutorial that will follow.